



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/662,406

09/16/2003

Joong Seo Park

YHK-0119

9669

34610

7590

01/23/2007

FLESHNER & KIM, LLP
P.O. BOX 221200
CHANTILLY, VA 20153

EXAMINER

SHERMAN, STEPHEN G

ART UNIT

PAPER NUMBER

2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

01/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/662,406	Applicant(s) PARK ET AL.	
	Examiner Stephen G. Sherman	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-8, 14-17 and 19-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-8, 14-17 and 19-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| <p>1) <input type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____</p> |
|---|--|

DETAILED ACTION

1. This office action is in response to the amendment filed the 21 August 2006. Claims 5-8, 14-17 and 19-30 are pending. Claims 1-4, 9-13 and 18 have been cancelled.

Response to Arguments

2. Applicant's arguments with respect to claims 5-8, 14-17 and 19-30 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 19 is objected to because of the following informalities: The claim ends in a comma instead of a period. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 5 and 14 recite the limitation "the number of sustaining pulses." There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 5-6, 14-15, 21-22 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tajima et al. (US 6,222,512).

Regarding claim 5, Tajima et al. disclose a driving apparatus for a plasma display panel in which one frame period is time-divided into a plurality of sub-fields each given by a certain weighting value (Figure 1 shows a driving apparatus for a plasma display panel and column 15, lines 36-51 explain that the frame period is divided into a plurality of sub-fields.), said driving apparatus comprising:

a gray level detector for detecting a gray level distribution of a data (Figure 3, gray-scale level adjustment means 75 is explained in column 26 lines 10-45 to have an intensity data arrangement switching means 101 that disperses and arranges the sub-frames.) and

an adjuster for adjusting at least one of the number of sustaining pulses or a sub-field arrangement in accordance with a gray level distribution of said data (Figure 1, the

gray-scale level adjustment means 75 is stated in column 16, lines 1-14 to establish which sub-frames are to be combined and how these are to be arranged in sequence.).

Regarding claim 6, Tajima et al. disclose the driving apparatus as claimed in claim 5, wherein said adjuster adjusts both the number of sustaining pulses and- a sub-field arrangement accordance with the gray level distribution of said data (The examiner understands that if the number of subfields and the arrangement is changed, that by changing the subfields used the number of sustaining pulses is changed, please refer to column 27, lines 7-16 and Figures 16 and 17 for an example.).

Regarding claim 14, this claim is rejected under the same rationale as claim 5.

Regarding claim 15, this claim is rejected under the same rationale as claim 6.

Regarding claim 21, Tajima et al. disclose the driving apparatus of claim 5, wherein the number of the sub-fields after said adjustment equals the number of sub-fields before said adjustment for driving the panel (Column 16, 14-33 explain that the sub-fields are re-arranged, but the number of subfields stays the same.).

Regarding claim 22, Tajima et al. disclose the driving apparatus of claim 5, wherein the weighting value assigned to each of the predetermined number of sub-fields is same before and after said adjustment (Column 16, 14-33 explain that the sub-

fields are re-arranged, such as SF6 in the middle and SF1 and SF2 on the ends, but the weighting value assigned to them is the same.).

Regarding claim 28, Tajima et al. disclose the driving apparatus of claim 5, wherein the adjuster includes: a sub-field arrangement selector which selects one of a plurality of pre-stored sub-field arrangements based on the gray-level distribution of said data (As stated in the rejection of claim 5, Figure 1 shows gray-scale level adjustment means 75 has sub-frame sequence pattern storage means 78.).

Regarding claim 29, Tajima et al. disclose the driving apparatus of claim 28, wherein the sub-field arrangements are predetermined to reduce contour noise for different regions having a largest portion of the gray-level distribution (Column 16, lines 21-28 explain that the sequences, i.e. arrangements are predetermined and column 42, lines 53-60 explain that this is done in order to suppress a false colored phenomenon.).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 7-8 and 16-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512) in view of Tanabe et al. (US 2003/0011626).

Regarding claim 7, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster reduces the number of sustaining pulses when gray levels of said data concentrate on a low gray level

Tanabe et al. disclose the driving apparatus as claimed in claim 5 wherein said adjuster reduces the number of sub-fields when gray levels of said data concentrate on a low gray level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale number is high there is seven or eight subfields, which is an increase in the number of sustaining pulses compared to when there are less sub-fields, since each sub-field contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sub-field reduction method taught by Tanabe et al. with the driving apparatus as taught by Tajima et al. such that the number of sustain

pulses would be reduced/increased in order to produce less power consumption as compared to when the sustain process is performed in each sub-field.

Regarding claim 8, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray level

Tanabe et al. disclose a driving apparatus wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale number is high there is seven or eight subfields, which is an increase in the number of sustaining pulses compared to when there are less sub-fields, since each sub-field contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to use the sub-field reduction method taught by Tanabe et al. with the driving apparatus as taught by Tajima et al. such that the number of sustain pulses would be reduced/increased in order to produce less power consumption as compared to when the sustain process is performed in each sub-field.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, this claim is rejected under the same rationale as claim 8.

11. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512) in view of AAPA (Figure 1 and page 1, line 1 to page 4, line 30 of the specification.).

Regarding claim 19, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fails to teach that the apparatus further comprises: an average picture level controller which detects an average brightness of said data and outputs information to set a number of sustaining pulses in each of a predetermined number of sub-fields corresponding to said data.

AAPA discloses a driving apparatus for a plasma display panel comprising of an average picture level controller (Figure 1, item 17) which detects an average brightness of said data and outputs information to set a number of sustaining pulses in each of a predetermined number of sub-fields corresponding to data (Page 3, line 29 to page 4, line 7 of the specification.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made that the plasma display panel taught by Tajima et al. include and APL controller as taught by AAPA in order to allow for the adjustment of the number of sustaining pulses to provide for a more stabilized brightness of the display.

Regarding claim 20, Tajima et al. and AAPA disclose the driving apparatus of claim 19.

AAPA also disclose wherein the average picture level detector detects the average brightness of said data as received from an inverse gamma controller (Figure 1 APL controller 17 receives its input from inverse gamma controller 11B.).

12. Claim 23-27 and 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512).

Regarding claim 23, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fail to teach wherein the adjuster generates a histogram of gray-level values corresponding to the gray-level distribution of said data, the adjuster performing said adjustment based on the histogram.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to generate a histogram of gray-level values corresponding to the gray-level distribution of said data with the adjuster performing the adjustment based on the histogram because this would allow for the determination of how the data is distributed and how it should be changed.

Regarding claim 24, Tajima et al. disclose the driving apparatus of claim 5, wherein the detector divides the gray-level distribution into a plurality of predetermined regions (Column 16, lines 34-40 explain that a region is chosen in which the subfield arrangement is chosen.).

Tajima et al. fail to teach wherein the adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to compare

the gray-level distribution in the regions and adjust the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison because this would allow for a more uniform brightness of the display over time.

Regarding claim 25, Tajima et al. disclose the driving apparatus of claim 24.

Tajima et al. fail to explicitly teach wherein the adjuster performs said comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the sub-fields to produce a corresponding change in brightness of the displayed image.

However, it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to perform the comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the sub-fields to produce a corresponding change in brightness of the displayed image in order to provide for a more uniform display output to the user for a better viewing experience.

Regarding claim 26, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster decreases the number of sustaining pulses to less than a predetermined references value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels.

However, it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to decrease

the number of sustaining pulses to less than a predetermined references value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels because lower gray level regions don't use as many sustaining pulses to create a desired brightness level.

Regarding claim 27, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster increases the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to increase the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels because higher gray level regions use more sustaining pulses to create a desired brightness level.

Regarding claim 30, Tajima et al. disclose the driving apparatus of claim 29.

Tajima et al. fail to explicitly teach wherein: in a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order, in a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses

in a third portion of the sub-fields changes in descending order; and in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses, however, Tajima et al. do suggest of placing the sub-frames in a descending order (Column 32, lines 38-50).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made that the predetermined sub-field arrangements taught by Tajima et al. would have a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order; a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses in order to allow for the reduction of false contour by using an appropriate sub-field arrangement.

Conclusion

Art Unit: 2629

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

17 January 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

